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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/099,912	03/14/2002	John H. Oates	0102323-00100	3592

21125 7590 05/17/2007

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EXAMINER	
VLAHOS, SOPHIA	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
05/17/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/099,912	OATES ET AL.	
	Examiner	Art Unit	
	SOPHIA VLAHOS	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-11,13-21 and 23-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *9 and 10* is/are allowed.

6)☒ Claim(s) *1 and 3-5, 7, 11, 13, 15, 17, 21, 23-24,26, 28-29* is/are rejected.

7)☒ Claim(s) *6,8,16,18-20 and 25-27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see "Remarks", filed 3/5/2007, with respect to the 35 U.S.C. 101 rejection of claims 1-29 have been fully considered and are persuasive. The rejection of claims 1-29 has been withdrawn.

Applicant's arguments filed 3/5/200 regarding the rejection of claims 1,2, and 21 under 35 U.S.C. 103(a) have been fully considered but they are not persuasive.

Specifically, Applicant argues: "In response, Applicants note that claim 1 recites not only storing the R-matrix to the first memory but also requires that such storage be done in a specific way, namely, storing the matrix to contiguous locations within the first memory. Such a feature is neither taught nor suggested by Moher."

Examiner disagrees and points out that Moher teaches al., teaches a multiuser detection algorithm (Fig. 57, column 6, brief description of Fig.57) and calculation of data estimates based on a cross-correlation matrix see equations (85), (or equations (90), (97) for a simplified symbol estimate formulas). Therefore, using a (first) memory to perform the matrix based calculations would be obvious to a person skilled in the art at the time of the invention, since the matrix and matrix elements are stored in the memory so that computations are performed. With respect to the limitation: contiguous locations within the memory, under the broadest interpretation of the claim and the teachings of matrix – based calculations taught by Moher, it is suggested that the entries of

the matrices to be in contiguous locations in the memory, to perform the calculations such as equations (85)-(86).

With respect to the arguments regarding the two different processing elements, the cross correlation matrix is supplied by the output of the matched filters (column 43, lines 46-57) and the decision algorithm -processing element generates the data estimates.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moher (U.S. 6,161,209).

With respect to claim 1, Moher discloses: a set of one or more first processing elements, the set of first processing elements generating a matrix (hereinafter "R-matrix") representative of cross correlations among user waveforms (column 43, lines 46-67, column 44, lines 1-29, matrix H is the matrix representative of cross-correlations among user waveforms (line 55 of column 43), also see column 55, lines 61-67, column 56 lines 1-14, and system of Fig. 57); a second processing element coupled with the first memory (Fig. 57, part of the Decision Algorithm element), the second processing element accessing the

R-matrix from contiguous locations within the first memory and generating symbol estimates as a composition of the R-matrix (see column 3, lines 5-8, column 4, lines 1-50, column 56, lines 21-65, equations 83-86, see estimation of transmitted symbol is a function (composition) of the cross-correlation matrix) and Fig. 57 where $\hat{b}$ (symbol estimates) see column 31, lines 56-59) are generated by the decision algorithm).

Moher does not expressly teach: a first memory, the set of one or more first processing elements, coupled to the first memory, and storing the R-matrix to contiguous locations within the first memory.

However, at the time of the invention, it would have been obvious to a person skilled in the art to use a memory (for example a computer) to store the R-matrix (the matrix shown in column 44, equation (129)) so that the R-matrix is easily accessible for further processing or just stored for future reference (with respect to the limitation storing the R-matrix in contiguous locations, considering that Moher discloses matrix based calculations to obtain the data estimates, the entries in the matrix are stored in contiguous locations so that calculations between matrix elements are performed).

4. Claims 3-4, 7, 21, 23, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moher (U.S. 6,161,209) in view of Schmidl (U.S. 6,816,541).

With respect to claim 3, Moher does not expressly teach: a second memory coupled with the set of first processing elements and a third processing element, the third processing element generating a matrix (hereinafter "gamma-

matrix") representative of a correlation between a code associated with one user and those associated with one or more other users, the third processing element places the gamma-matrix in the second memory.

In the same field of endeavor, Schmidl discloses: a third processing element, the third processing element generating a matrix (hereinafter "gamma-matrix") representative of a correlation between a code associated with one user and those associated with one or more other users (column 3, lines 20-22, the "third" processing element is not shown but computation of matrix $R_{m,n}$ (can call this matrix a gamma matrix too) taking place in a processing element, see also column 3, lines 37-41 where I_m is the real part of the multi-user interference and column 3, lines 65-67 where I_m is subtracted to compute the data estimation and first equation of column 4, computing the I_m using R_{mn} – the gamma matrix).

At the time of the invention, it would have been obvious to a person skilled in the art to use the processing element of Schmidl that generates a matrix (hereinafter "gamma-matrix") representative of a correlation between a code associated with one user and those associated with one or more other users, so that the gamma matrix can be used to estimate multi-user interference (Schmidl , column 2, lines 8-19 see interference cancellation).

With respect to the limitations a second memory coupled with the set of first processing elements and the third processing element, the third processing element places the gamma-matrix in the second memory; at the time of the invention, it would have been obvious to a person skilled in the art to use a second memory (in a software routine for example) to store (place) the generated

gamma matrix so that the matrix is readily available for future reference and/or subsequent computations and it would have been obvious to a person skilled in the art to couple the second memory with the set of first processing elements a (that generated the R-matrix and perform data estimation) and third processing element (that generates the gamma matrix) so that the generated matrices can be readily retrievable for future reference or processing by the system of Moher.

With respect to claim 4, all of the limitations of claim 4, are analyzed above in claim 3, and the combination of Moher and Schmidl discloses: the third processing element generating the gamma-matrix and placing that matrix in contiguous location within the second memory (see claim 3 above), the set of first processing elements accessing the gamma-matrix from contiguous locations within the second memory (the combination of the Moher and Schmidl where the interference (computed using the gamma matrix) is taken into account (subtracted from the data estimates)) and generating the R-matrix (see column 55, lines 61-67, column 56 lines 1-14 of Moher)((with respect to the limitation placing the (gamma) matrix in contiguous locations, considering that Moher discloses matrix based calculations to obtain the data estimates, the entries in the matrix are stored in contiguous locations so that calculations between matrix elements are performed).

With respect to claim 7, all of the limitations of claim 7 are analyzed above in claim 3, and the combination of Moher and Schmidl discloses: wherein the

third processing element updates the gamma-matrix as users are added or removed from the spread spectrum system (see Schmidl, column 4, lines 25-30 (where the R-matrix corresponding to the gamma matrix of claim 3) is shown and any zero rows or columns would indicate the absence of users from the system and non-zero columns indicate their presence).

With respect to claim 21, 23, 26, these claims are rejected based on rationale similar to the one used to reject claims 3, 4, and 7 respectively.

5. Claims 5, 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moher (U.S. 6,161,209) in view of Schmidl (U.S. 6,816,541) and Milan et. al., (U.S. 7,028,114).

With respect to claim 5, all of the limitations of claim 5 are analyzed above in claim 3, but the combination of Moher and Schmidl does not expressly teach: a multi-port switch coupled to the third processing element and to the second memory, wherein the third processing element places the gamma-matrix in the second memory via the multi-port switch.

Solving the same problem: data transfer (between processing elements and a memory) Milan et. al., discloses: a multi-port switch coupled to a processing element and a memory (see column 1, lines 35-39, and 57-61, where the multi-port switch is the usb hub, the memory is a computer/computer program and the processing element is any peripheral device connected to the computer). At the time of the invention, it would have been obvious to a person

skilled in the art to use the wireless usb hub of Milan et. al., in the system of taught by the combination of Moher and Schmidl (coupled to the third processing element and the second memory) to transfer the generated matrix from the processing element to the memory (computer program in a computer) without any cable connection (less clutter).

With respect to claim 24, claim 24 is rejected based on a rationale similar to the one used to reject claim 5.

6. Claims 11, 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moher (U.S. 6,161,209) in view of Schmidl (U.S. 6,816,541) and Harvey et. al., "DMA Fundamentals on Various PC platforms" National Instruments , April 1991, (pages 1-2).

With respect to claim 11, the limitations of claim 11 are rejected based on a rationale similar to the one used to reject claim 1 above, but Moher does not expressly teach: the set of one or more first processing elements, coupled to a direct memory access engine (hereinafter "DMA engine"), the DMA engine coupled with the first memory, the DMA engine storing that the R-matrix to contiguous locations within the first memory.

Solving the same problem (data transfer between processing elements and memory), Harvey e. al., disclose: a direct memory access engine (DMA) (see DMA controller in a computer, last paragraph of page 1, continued to page 2). At the time of the invention, it would have been obvious to a person skilled in

the art to use the DMA controller (engine) (that is a built-in feature of a pc) to perform data transfer from an I/O device (such as the set of one or more first processing elements) to the computer (memory) since it allows for high speed data transfers, and the data transfers occur in parallel, it increases overall system (pc) utilization (Harvey et. al., see second paragraph of "overview" section page 1)

With respect to claims 28, all of the limitations of claim 28 are analyzed above in claim 21, and claim 28 is analyzed similarly to claim 11 above (where the DMA can be coupled to the second processing elements (part of the system shown in Fig. 57 of Moher as the I/O device) and the first memory (computer)).

With respect to claims 29, all of the limitations of claim 29 are analyzed above in claim 21, and claim 29 is analyzed similarly to claim 11 above. (where the DMA can be coupled to the third processing elements (part of the system shown in Fig. 57 of Moher that was modified based on the teachings of Schmidl as the I/O device) and the second memory (computer)).

8. Claims 13, 14, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moher (U.S. 6,161,209) in view of Schmidl (U.S. 6,816,541).and Harvey et. al., "DMA Fundamentals on Various PC platforms" National Instruments , April 1991, (pages 1-2).

With respect to claim 13-14, 17, claims 13-14, 17 are rejected based on rationale similar to the one used to reject claims 3-4, 7 respectively.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moher (U.S. 6,161,209) in view of Schmidl (U.S. 6,816,541), Harvey et. al., "DMA Fundamentals on Various PC platforms" National Instruments , April 1991, (pages 1-2), Milan et. al., (U.S. 7,028,114).

With respect to claim 15, claim 15 is rejected based on a rationale similar to the one used to reject claim 5 above.

Allowable Subject Matter

10. Claims 6,8, 16, 18, 19-20,25, 27 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of the record fails to teach or suggest alone or in combination: A communications device for detecting user transmitted symbols encoded in spread spectrum waveforms (hereinafter "user waveforms") comprising a host controller coupled to each of the set of first processing elements, wherein the host controller generates a partitioning of the R-matrix, that partitioning divides the R-matrix into one or more portions based on a

number of users and a number of available processing elements, the host controller assigns to each first processing element a portion of the R-matrix to generate according to the partitioning, each of the first processing elements generating the assigned portion of the R-matrix according to the partitioning, the host controller re-calculates the partitioning of the R-matrix when a user is added or removed from the spread spectrum system, and assigns a new portion of the R-matrix to each first processing element according to that new partitioning, as recited in claim 9, and in combination with other elements of the claim.

Claims 9-10 are allowed.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SOPHIA VLAHOS whose telephone number is 571 272 5507. The examiner can normally be reached on MTWRF 8:30-17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 571 272 3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SV
5/2/2007

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